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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,860	06/24/2003	Suk-Gyun Han	1349.1207	7183

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EXAMINER

SAN MARTIN, EDGARDO

ART UNIT PAPER NUMBER

2837

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/601,860	HAN, SUK-GYUN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Edgardo San Martin	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 6,037,741) in view of Watanabe et al. (US 5,424,960).

With respect to claims 1, 2, 6 – 8, 12 and 15, Yamada et al. teach an apparatus and method to control a stepper motor, comprising a torque calculator to calculate torque applied to the stepper motor and to output a driving current setting signal corresponding to the calculated torque, a controller to output a control signal to apply variable driving current which is based on the driving current setting signal, to the stepper motor; and a driver to drive the stepper motor based on the control signal inputted from the controller; further comprising a current detector to detect driving current flowing into the stepper motor and to output the detected driving current to the torque calculator (Fig.3; Col.11, Line 28 - Col.12, Line 24). However, with respect to claims 1, 12 and 15, Yamada et al. fail to disclose wherein the torque calculator calculate torque applied to the stepper motor from the driving current and from stored driving current settings.

On the other hand, Watanabe et al. teach a stepper motor control system comprising a torque calculator that calculate torque applied to the stepper motor from

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the driving current and from stored driving current settings and to output a driving current setting signal corresponding to the calculated torque (Figs.1A and 1B; Abstract, Col.2, Line 65 – Col.3, Line 57 and Col.5, Line 43 – Col.6, Line 31).

It would have been obvious to a person with ordinary skill in the art at the time of the invention was made to employ the Watanabe et al. torque calculator system with the Yamada et al. motor control design because the Watanabe et al. torque calculator system would permit the comparison of an actual measured amount with a premeasured/stored amount, allowing the determination of any error or difference in the control system driving signals, and the indication that a driving signal change needs to be done in order to provide a desired motor performance.

With respect to claims 3 and 13, Yamada et al. and Watanabe et al. teach the limitations discussed in a previous rejection, but fail to disclose the torque calculator comprising a D/A converter to convert the read driving current setting information into analog signals.

The Examiner takes Official Notice that it is well known in the art of motor control to employ a digital to analog converter to convert a digital signal into an analog signal.

It would have been obvious to a person with ordinary skill in the art at the time of the invention was made to employ a D/A converter in the Yamada et al. and Watanabe et al. design because it would provide with an element that would convert the digital signal that the torque calculator produce to an analog signal that would be provided to the motor.

With respect to claims 4 and 5, Yamada et al. teach further comprising a storage unit (Fig.3, Item 124) to store the driving current setting information corresponding to the calculated torque information therein, and wherein the storage unit stores the calculated torque information and the corresponding driving current setting information therein, causing the torque to be proportional to the driving current (Col.11, Lines 44 - 55 and Col.12, Lines 13 - 24).

With respect to claims 9 – 11 and 14, Yamada et al. teach the claimed subject matter described in the claims (Col.11, Line 28 - Col.12, Line 24).

### ***Response to Arguments***

2. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. The Examiner considers that the obvious combination of the patent to Yamada et al. in view of Watanabe et al. teach the limitations described in the claims, as discussed above.

The examiner notes that the statements presented in the previous Office Action regarding the well-known status of several elements were not challenged or traversed. This is taken as an admission of the Applicant that the elements are well known. *In re Chevenard*, 139 F.2d 71, 60 USPQ 239 (CCPA 1943).

### ***Conclusion***

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo San Martin whose telephone number is (571) 272-2074. The examiner can normally be reached on 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "E. San Martín".

Edgardo San Martín  
Primary Examiner  
Art Unit 2837  
Class 318  
February 27, 2005